

Different carbon nanostructures obtained on Fe/SiO₂ and Fe/Al₂O₃ catalyst with various phase composition

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The catalytic synthesis of different carbonaceous materials, including carbon nanofibers, nanotubes and encapsulated nanoparticles has been the subject of a numerous publications over the past decade. This is caused by search of a new catalyst and promised carbon materials application prospects. In this work the growth of carbon nanostructures by a catalytic route which represents the decomposition of propane over Fe/SiO₂ and Fe/Al₂O₃ composite obtained by consecutive chemical synthesis is considered.

The sequence of structure transformation in metal particles at all stages of the synthesis has been studied by means of mossbauer spectroscopy, transmission electron microscopy, electron diffraction and thermoanalytical methods. The carbon outcome and carbon structures types in dependence of catalytic particles size, phase and structure have been analyzed for the samples with different Fe to SiO₂/Al₂O₃ weight ratio.

It was revealed that the morphology and the size of the nanocomposite particles and, as a result, their catalytic properties are highly sensitive from phase composition.